

DEMOLITION OF BUILDING 51 AND THE BEVATRON

Draft Environmental Impact Report

Prepared for:
Lawrence Berkeley National Laboratory

October 21, 2005

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CHAPTER I

Introduction

This environmental impact report (EIR) evaluates a proposed project to demolish the Bevatron and the structure housing it, Building 51, at Lawrence Berkeley National Laboratory (LBNL; also referred to as “Berkeley Lab,” “the Laboratory,” or “the Lab” in this document). Berkeley Lab is an approximately 200-acre multi-program research laboratory operated and managed by the University of California (UC or the University) under a contract with the U.S. Department of Energy (DOE), and is a DOE National Laboratory. The project site is located on land owned by The Regents of the University of California within the City of Berkeley boundaries.

The Bevatron, which went out of service in 1993, is an approximately 180-foot-diameter particle accelerator. Building 51 is an approximately 126,500-gross-square-foot shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop and office functions. The project site is approximately four acres, including parking and staging areas. Of this total, approximately 2.25 acres would be converted from developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another use for this area is proposed, approved, and initiated.

Project objectives and activities are described in detail in Chapter III, Project Description. In brief, the Bevatron and Building 51 are no longer needed by LBNL. The Bevatron has not been operated since 1993 and is non-functional. The Building 51 structure that houses the Bevatron is deteriorating, and consumes disproportionate maintenance resources. It does not meet current building codes, the roof leaks in several locations, and portions of the structure do not comply with current seismic design standards. In addition, removal of the building and its contents would free up the site for future development. However, while development of the site is likely at some point in the future, at this time, there are no firm plans for future development that have reached the level of a proposed or reasonably foreseeable action.

Under the proposed project, the concrete shielding blocks that surround the Bevatron would be removed, the Bevatron apparatus disassembled, Building 51 and the shallow foundation underneath the building demolished, and the resulting debris and other materials removed. The 2.25-acre demolition zone would then be backfilled, compacted to grade, and hydro-seeded with native grasses.

The EIR has been prepared pursuant to the applicable provisions of the California Environmental Quality Act (CEQA) and its implementing guidelines (CEQA Guidelines), and the Amended University of California Procedures for Implementation of the California Environmental Quality Act (UC CEQA Procedures). The University of California is the lead agency for this EIR. The

Board of Regents of the University of California (The Regents) is the University's decision-making body. The Regents have delegated authority to the Director of LBNL to approve this type of project for CEQA purposes.

CEQA requires that, before a decision can be made by a state or local government agency to approve a project with potentially significant environmental effects, an EIR must be prepared that fully describes the environmental effects of the project. The EIR is an informational document for use by governmental agencies and the public. It is intended to identify and evaluate potential environmental consequences of the proposed project, to identify mitigation measures that would lessen or avoid significant adverse impacts, and to examine feasible alternatives to the project. The information contained in the EIR is reviewed and considered by the lead agency prior to its action to approve, disapprove, or modify the proposed project.

This EIR has been prepared to inform the Director of LBNL, the University of California, responsible agencies, trustee agencies, and the public of the proposed project's environmental effects. The EIR is intended to publicly disclose those impacts that may be significant and adverse, identify the possible measures that would mitigate or avoid such impacts, and describe a reasonable range of alternatives to the project.

A. Type and Scope of the EIR

This EIR is a tiered project EIR. The EIR is tiered from three programmatic, facility-wide CEQA documents:

- *The Lawrence Berkeley Laboratory Site Development Plan Environmental Impact Report*, August 1987 (State Clearinghouse No. [19]85112610);
- *The Supplemental Environmental Impact Report for the Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Lawrence Berkeley Laboratory*, September 1992 (State Clearinghouse No. [19]91093068); and
- *The Supplemental Environmental Impact Report Addendum for the Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Ernest Orlando Lawrence Berkeley National Laboratory*, September 1997 (State Clearinghouse No. [19]91093068).

These documents are referred to herein as the "1987 Long Range Development Plan (LRDP) EIR, as amended."¹

The proposed project EIR is tiered from the 1987 LRDP EIR, as amended, in accordance with Sections 15152 and 15168 of the CEQA Guidelines and Public Resource Code Section 21094.

¹ The 1987 Site Development Plan EIR was prepared for the 1987 LBNL Long Range Development Plan. That EIR subsequently has been referred to as the 1987 LRDP EIR. "Long Range Development Plan" is the University of California's term for a campus-wide planning document. Each UC campus (in the case of LBNL, a Department of Energy National Laboratory managed by UC) is required to periodically re-examine its academic goals and devise physical plans to support them. The LRDP is the planning tool to guide the physical development of the site.

The 1987 LRDP EIR, as amended, is a Program EIR, prepared pursuant to Section 15168 of the CEQA Guidelines (Title 14, California Code of Regulations, Sections 15000 et seq.). The 1987 LRDP EIR, as amended, analyzed full implementation of uses and physical development proposed under the 1987 LRDP through the year “20XX,” which is an indeterminate horizon year flexibly projected to occur sometime after the year 2000. Measures were identified in the 1987 LRDP EIR, as amended, and adopted by The Regents, to mitigate the significant adverse project and cumulative impacts associated with that growth.

The CEQA concept of “tiering” refers to the coverage of general environmental matters in broad program-level EIRs, with subsequent focused environmental documents for individual projects that implement the program. This environmental document incorporates by reference the analyses in the 1987 LRDP EIR, as amended, and concentrates on project-specific issues. CEQA and the CEQA Guidelines encourage the use of tiered environmental documents to reduce delays and excessive paperwork in the environmental review process. This is accomplished in tiered documents by eliminating repetitive analyses of issues that are adequately addressed in the Program EIR and by incorporating those analyses by reference.

Section 15168(d) of the CEQA Guidelines provides for simplifying the task of preparing environmental documents on later parts of the program by incorporating by reference factors that apply to the program as a whole. Consistent with CEQA Guidelines Section 15152(d), where an EIR has been prepared or certified for a program or plan, the environmental review for a later activity consistent with the program or plan should be limited to effects that were not analyzed as significant in the prior EIR or that are susceptible to substantial reduction or avoidance.

Accordingly, the tiering of the environmental analysis for the proposed project allows this tiered EIR to rely on the 1987 LRDP EIR, as amended, for the following:

- A discussion of general background and setting information for environmental topic areas;
- Overall growth-related issues;
- Issues that were evaluated in sufficient detail in the 1987 LRDP EIR, as amended, for which there is no significant new information or change in circumstances that would require further analysis;
- Long-term cumulative impacts assessment; and
- Mitigation measures from the 1987 LRDP EIR, as amended, that are applicable to the proposed Building 51 demolition project.

The purpose of this tiered EIR is to evaluate the potential environmental impacts of the proposed project with respect to the 1987 LRDP EIR, as amended. The analysis in this EIR includes consideration of whether there have been any changes in circumstances or new information since the last update to the LRDP EIR that require further analysis, in accordance with CEQA Guidelines Section 15168 and 15152.

A list of 1987 LRDP EIR, as amended, mitigation measures that are incorporated into the project description and project-specific mitigation measures, is provided in each section, as well as in Chapter II, Summary.

LBNL is undergoing a multi-year process to prepare a new LRDP and LRDP EIR. If adopted by The Regents of the University of California, these documents would replace the 1987 LRDP EIR, as amended, and guide future development at LBNL for approximately 20 years. It is expected that draft versions of these documents will be available for public review in 2006. The new LRDP EIR will consider the Building 51 and Bevatron demolition project in its analysis of cumulative impacts. Although the current LRDP and 1987 LRDP EIR, as amended, are the applicable guiding documents for this proposed project, it is anticipated that the proposed project would also be consistent with the new LRDP and LRDP EIR.

B. Environmental Review Process

On March 15, 2005, LBNL issued a Notice of Preparation (NOP) to governmental agencies, organizations, and interested persons for the proposed project. A public scoping meeting was held on March 31, 2005 at the North Berkeley Senior Center in Berkeley. Comments received regarding the proposed content of the EIR have been considered in developing the scope of this Draft EIR.

This Draft EIR will be published and circulated for review and comment by the public and other interested parties, agencies, and organizations for a 45-day period. The public review period will be from October 21, 2005 to December, 7, 2005. **A public hearing on the Draft EIR will be held from 6:30 p.m. to 8:30 p.m. on November 16, 2005 at the North Berkeley Senior Center. The North Berkeley Senior Center is located at 1901 Hearst Street in Berkeley.** The public is invited to attend the hearing and to offer comments on the Draft EIR. All comments or questions about the Draft EIR should be addressed to:

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Following the public review, responses to all substantive comments received on the adequacy of the Draft EIR and submitted within the specified review period will be prepared and included in the Final EIR. It is anticipated at this time that the Final EIR and a Mitigation Monitoring Program will be reviewed by the LBNL Director, who would then determine whether to certify the Final EIR as complete and adequate, and approve the project.

Project requirements and required mitigation measures identified in the EIR and Mitigation Monitoring Program would be implemented by LBNL and, as appropriate, by contractors employed to implement the project. Such requirements that are applicable to contractors would be written into contracts or other agreements between LBNL and the contractors, as appropriate.

LBNL would oversee proper implementation of these requirements and would monitor implementation of the mitigation program.

Projects taking place at LBNL that use federal funding or receive discretionary approval from federal agencies require review and approval pursuant to the National Environmental Policy Act (NEPA). A separate Environmental Assessment for the project will be prepared in accordance with NEPA requirements.

C. Organization of the Draft EIR

This EIR is organized to allow the reader to review a summary of the analysis, review the recommended mitigation measures, and identify the residual environmental impacts after mitigation, if any (see Chapter II, Summary). Those readers who wish to read the Draft EIR in greater detail are directed to Chapter IV, Environmental Setting, Impacts, and Mitigation Measures.

The Draft EIR begins with this Introduction (Chapter I). The chapters following the Introduction are organized as follows:

Chapter II, Summary, describes the proposed project, major areas of controversy, the environmental effects of the project, and alternatives to the project (including the No Project Alternative). The Summary includes Table II-1, Summary of Environmental Impacts and Mitigation Measures, which includes a list of applicable mitigation measures from the 1987 LRDP EIR, as amended, and new mitigation measures that would be implemented to reduce the significance of potentially significant impacts.

Chapter III, Project Description, provides a description of the project site and location, project objectives and characteristics, and the approval process.

Chapter IV, Environmental Setting, Impacts, and Mitigation Measures, contains an analysis of environmental topics. The discussion of each topic is divided into an *introductory paragraph* that describes the scope of the issue under consideration; a *Setting* section that describes baseline environmental information; and an *Impacts and Mitigation Measures* section that sets forth general standards of significance for potential impacts, describes project-specific and cumulative impacts, and sets out applicable mitigation measures.

Chapter V, Alternatives, provides an analysis of a reasonable range of alternatives to the proposed project, including identification of the “environmentally superior” alternative.

Chapter VI, CEQA Considerations, reviews the significant, irreversible effects and cumulative impacts identified in Chapter IV, and describes the project’s potential for inducing growth.

Chapter VII, Report Preparation, lists the firms and staff members who prepared the EIR.

Chapter VIII, Agencies and Persons Contacted, lists the persons, agencies, and organizations who were contacted during preparation of the EIR.

Chapter IX, Bibliography, provides a list of documents cited in the EIR.

Chapter X, Acronyms, presents an explanation of acronyms and abbreviations used in the EIR.

Chapter XI, Appendices, presents the background documents and technical information used in support of the impact analyses provided in the EIR. Appendix A contains the NOP and Initial Study; Appendix B contains background biological resources information; Appendix C contains the *Agreement between LBNL and DOE Berkeley Site Office, LBNL Implementation of DOE Metal Release Suspension* (April 22, 2005) and LBNL's *Protocol for Survey and Release of Bevatron Materials* (June 30, 2005); and Appendix D contains the *Noise Study for the Demolition of Building 51*.

CHAPTER II

Summary

This summary is intended to highlight major areas of importance in the environmental analysis, for use by decision-makers and the public, and to provide the information required under CEQA. It includes a brief description of the proposed project, major issues raised by community members, and a summary of project alternatives. In addition, this section provides a table summarizing (1) the potential environmental impacts that would occur as a result of the project, and (2) mitigation measures that enable the project to avoid most significant environmental impacts.

A. Project Description

The project proposes to demolish the Bevatron and the structure housing it, Building 51, at Berkeley Lab. During its operation from 1954 until 1993, the Bevatron was among the world's leading particle accelerators, and during the 1950s and 1960s, four Nobel Prizes were awarded for work conducted in whole or in part there. The Bevatron is approximately 180 feet in diameter. Building 51 is a large (approximately 126,500 gross square foot) shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop and office functions. Since the end of the Bevatron's operations in 1993, Building 51 has had limited use for equipment storage, office space, and dry laboratories.

The Bevatron and Building 51 are no longer needed by LBNL. The Bevatron has not operated since 1993 and is non-functional. The Building 51 structure housing the Bevatron is deteriorating, and consumes disproportionate maintenance resources. It does not meet current building codes, the roof leaks in several locations, and portions of the structure do not comply with current seismic design standards. In addition, removal of the building and its contents would free up the site for future development. However, while development of the site is likely at some point in the future, at this time, there are no firm plans for future development that have reached the level of a proposed or reasonably foreseeable action.

The project site is approximately four acres in size, including parking and staging areas. Of this total, approximately 2.25 acres would be converted from developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another project is proposed, approved, and initiated. Under the proposed project, the concrete shielding blocks that surround the Bevatron would be removed, the Bevatron apparatus would be disassembled, Building 51 and the shallow foundation underneath the building demolished, and the resulting debris and other materials removed. The site would then be backfilled, and the fill compacted and leveled. The

duration of the physical work for the project may vary from four to seven years, from early 2006 through 2009 or 2012, contingent upon funding and results of material sampling. For the purposes of conservative impact assessment, where impacts presumably are intensified in a shorter project timeframe, the project is assumed to take place over a four year period.

Approximately half of the materials that would be removed would consist of non-hazardous debris and other items typical of building demolition projects. Hazardous waste, low-level radioactive waste, and mixed waste also would be shipped from the site. The project would seek to reuse or recycle materials (e.g., uncontaminated metals and concrete) where feasible. Items that could not be reused or recycled would be handled and disposed in accordance with applicable policies and regulations. An estimated maximum of about 4,700 one-way truck trips to ship items off-site, and to bring in such things as equipment and fill material for bringing the site back to a level condition, would be required over the course of the project. A maximum of about 50 temporary workers would be used by the project at any one time. See Chapter III, Project Description, for a more detailed description of project objectives and activities.

B. EIR Scoping Process and Areas of Controversy

On March 15, 2005, LBNL issued a Notice of Preparation (NOP) of an EIR for the proposed project to governmental agencies, organizations, and interested persons for the proposed project. A public scoping meeting was held on March 31, 2005 at the North Berkeley Senior Center in Berkeley. The NOP and associated Initial Study are included as Appendix A to this EIR.

Potential impacts regarding the exposure of people to radiation and other types of contaminants were the principal areas of public controversy regarding the project, raised in written responses to the March 15, 2005, Notice of Preparation, and in a public scoping meeting held on March 31, 2005, at the North Berkeley Senior Center in Berkeley. Additional concerns included: impacts to residents from truck traffic; impacts to groundwater and surface water quality; the cultural resources impact of demolishing an historic structure and the desirability of an alternative in which the structure would not be demolished but rather its contents be allowed to "decay in place;" the appropriateness of tiering CEQA documentation for the project off of the 1987 LRDP and EIR; cumulative impacts of the proposed project combined with other LBNL and UC Berkeley projects; and the need for independent agency oversight of the project.

Agency comments included requests for discussion in the EIR of the project's impacts on the following areas, among others: wastewater flow; historical resources, transportation safety; groundwater quality; the relation between the project and environmental cleanup projects at Berkeley Lab; and materials testing arrangements.

C. Impacts and Mitigation Measures

Potential environmental impacts of the project are summarized in Table II-1, Summary of Impacts and Mitigation Measures, below. The table includes applicable mitigation measures, and less than significant impacts and significant impacts that could result from the proposed project.

Please refer to Chapter IV, Environmental Setting, Impacts, and Mitigation Measures, for a complete discussion of each impact and associated mitigation.

As stated in Table II-1 and in Chapter IV, the project would not result in any significant impacts that could not be mitigated to a less than significant level through implementation of mitigation measures included in the 1987 LRDP EIR, as amended, and/or project-specific mitigation measures identified in this report except for the significant unavoidable impacts to historic resources (see Section IV.D, Cultural Resources).

D. Alternatives to the Project

Chapter V of this EIR analyzes three alternatives to the proposed project: the No Project Alternative, required by CEQA for all EIRs; a Preservation Alternative; and an On-Site Rubbling Alternative. Chapter V also briefly discusses and rejects from further consideration two other alternatives.

No Project Alternative

Under this alternative, the Bevatron would not be dismantled and Building 51 would not be demolished. Radioactive materials, as well as other hazardous materials such as lead dust, oils, and asbestos, would continue to remain in place.

Preservation Alternative

Under the Preservation Alternative, the entire site would be dedicated to non-LBNL uses and could be managed by another public agency, such as the National Park Service, with the intention of actively preserving Building 51 and the Bevatron equipment within it. The public agency would maintain and preserve the building in accordance with the *Secretary of the Interior's Standards for Preservation*, and would allow limited public access for interpretive/educational purposes. These Standards for Preservation define Preservation as “the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.” This alternative would also allow some level of abatement of hazardous materials, such as lead and asbestos removal, to the extent that abatement can be accomplished while maintaining the Bevatron equipment in place.

This alternative would greatly reduce or eliminate the significant impact to historical resources that would be created by the proposed project, but would not achieve most of the Laboratory's goals for the site. In addition, the facility would still require long-term maintenance and substantial financial investment for clean-up and refurbishment. This would include such things

as significant reroofing and exterior waterproofing. Reinforcement would be required to strengthen the structure to make it seismically safe. New roll-up doors would also be required to replace those that were either removed or are inoperable. Due to the continuing presence of hazardous materials, the facility would have to be patrolled periodically to prevent unauthorized uses, and, as would be the case for any unoccupied building, that it did not become occupied by unwanted animals or pests.

This alternative has been identified as the environmentally superior alternative, and an impact analysis was completed to evaluate potential effects associated with this alternative (see Chapter V, Alternatives).

On-Site Rubbling Alternative

Under the On-Site Rubbling Alternative, activities called out in the Project Description would remain the same with the exception of activities related to concrete. In this alternative, a local “crushing plant” operation would be set up in the work zone outside of Building 51. Two large (approximately 35 feet [length] by 15 feet [width] by 10 feet [height]) diesel-powered concrete crushing machines would form the core of the operation. Concrete from shielding, the building walls and floor and foundation would be broken up using the crushing equipment. Following initial crushing, the material would require transfer by heavy equipment for processing through a second crusher to achieve the uniform sizing necessary to make the material attractive for reuse.

Under this alternative, most of the concrete from the building structure (i.e., walls and floors), foundation, and many of the concrete blocks shielding the Bevatron would be rubbled on-site. Metal (e.g., rebar) in the debris would be separated and disposed of separately. Only concrete containing no detectable added (i.e., non-naturally occurring) radioactivity and otherwise clear of contaminants would be rubbled. The rubbled material and segregated reinforcing steel would be recycled if public or private sector demand was available at the time of production. If not, it would be disposed of at a landfill. LBNL could use the rubble as aggregate or fill material if the need for such materials coincided with its production.

This alternative would not eliminate the significant unavoidable impact to cultural resources. This alternative would in effect trade-off increased air quality and noise effects on-site against decreases in truck traffic off-site. Since none of these impacts are significant, the alternative would not reduce any significant impacts to less than significant.

TABLE II-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

A. Aesthetics	
Mitigation Measures Included as Part of the Proposed Project	
<i>1987 LRDP EIR, as amended, Mitigation Measures</i>	<i>Project Measures and/or Contractor Specifications (identified in this EIR)</i>
Mitigation Measure III-D-2a: Revegetation of disturbed areas, including slope stabilization sites, using native shrubs, trees, and grasses will be included as part of all new projects.	None required.
Less than Significant Impacts	
IV.A-1: Demolition activities associated with the proposed project, and the removal of Building 51 itself, would result in changes to the visual quality of the site and its surroundings.	
IV.A-2: The project could potentially increase the amount of light and glare emitted from the project site.	
IV.A-3: The project could potentially contribute considerably to a significant cumulative aesthetic impact.	
Significant Impacts	
None.	
B. Air Quality	
Mitigation Measures Included as Part of the Proposed Project	
<i>1987 LRDP EIR, as amended, Mitigation Measures</i>	<i>Project Measures and/or Contractor Specifications (identified in this EIR)</i>
Mitigation Measure III-J-1: Construction contract specifications would require that during construction exposed surfaces would be wetted twice daily or as needed to reduce dust emissions. In addition, contract specifications would require covering of excavated materials. ¹	None required.
Less than Significant Impacts	
IV.B-1: Project-related demolition activities would generate short-term emissions of criteria pollutants, including fine and respirable particulate matter and equipment exhaust emissions, and possibly asbestos-containing materials.	
IV.B-2: The proposed project could potentially result in a cumulatively considerable contribution to regional air quality impacts.	
Significant Impacts	
None.	

¹ LBNL Facilities Department Master Specifications require that contractors comply with all BAAQMD Rules and Regulations such as, for example, the use of acceptable solvent-based products such as coatings and sealants.

TABLE II-1 (CONT.)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

C. Biological Resources	
Mitigation Measures Included as Part of the Proposed Project	
1987 LRDP EIR, as amended, Mitigation Measures	Project Measures and/or Contractor Specifications (identified in this EIR)
<p>Mitigation Measure III-D-2a: Revegetation of disturbed areas, including slope stabilization sites, using native shrubs, trees, and grasses will be included as a part of all new projects.</p> <p>Mitigation Measure III-D-2b: Invasion of opportunistic colonizer trees and shrubs will be controlled. A maintenance program for controlling further establishment of eucalyptus, green wattle acacia, French broom, cotoneaster, and other opportunistic colonizer shrubs and trees in disturbed areas on-site will be undertaken. Herbicides will not be used for this purpose.</p> <p>Mitigation Measure III-D-2c: Removal of native trees and shrubs will be minimized. (To the greatest extent possible, the removal of large coast live oak, California bay, and Monterey pine trees will be avoided.)</p>	<p>Project Measure IV.C-1: Pre-Demolition Special-Status Avian Survey and Subsequent Actions. No more than two weeks in advance of any demolition activity involving concrete breaking or similarly noisy or intrusive activities that will commence during the breeding season (February 1 through July 31), a qualified wildlife biologist shall conduct pre-demolition surveys of all potential special-status bird nesting habitat in the vicinity of the Building 51 project site and, depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on nesting special-status nesting birds:</p> <ol style="list-style-type: none"> 1. If active nests of special-status birds are found during the surveys, a no-disturbance buffer zone will be created around active nests during the breeding season or until a qualified biologist determines that all young have fledged. The size of the buffer zones and types of construction activities restricted within them will be determined through consultation with the CDFG, taking into account factors such as the following: <ol style="list-style-type: none"> a. Noise and human disturbance levels at the project site and the nesting site at the time of the survey and the noise and disturbance expected during the construction activity; b. Distance and amount of vegetation or other screening between the project site and the nest; c. Sensitivity of individual nesting species and behaviors of the birds. 2. If pre-demolition surveys indicate that no nests of special-status birds are present or that nests are inactive or potential habitat is unoccupied, no further mitigation is required. 3. Pre-demolition surveys are not required for demolition activities scheduled to occur during the non-breeding season (August 1 through January 31). 4. Noisy demolition activities as described above (or activities producing similar noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any breeding birds taking up nests would be acclimated to project-related activities already under way). However, if trees and shrubs are to be removed during the breeding season, the trees and shrubs will be surveyed for nests prior to their removal, according to the survey and protective action guidelines 1a through 1c, above.

TABLE II-1 (CONT.)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

C. Biological Resources (cont.)

5. Nests initiated during demolition activities are presumed to be unaffected by the activity, and a buffer is not necessary.
6. Destruction of active nests of special-status birds and overt interference with nesting activities of special-status birds shall be prohibited.
7. The noise control procedures for maximum noise, equipment, and operations identified in Section IV.I of this EIR shall be implemented.
8. After consideration of LRDP Mitigation Measure III-D-2c, shrubs that have been determined to be unoccupied by special-status birds may be removed as long as they are located outside of any buffer zones established for active nests.

Project Measure IV.C-2: Pre-Demolition Special-Status Bat Survey and Subsequent Actions. No more than two weeks in advance of any demolition activity involving concrete breaking or similarly noisy or intrusive activities, that will commence during the breeding season (March 1 through August 31), a qualified bat biologist, acceptable to the CDFG, shall conduct pre-demolition surveys of all potential special-status bat breeding habitat in the vicinity of the Building 51 project site.

Under such surveys, potentially suitable habitat shall be located visually. Bat emergence counts shall be made at dusk as the bats depart from any suitable habitat. In addition, an acoustic detector shall be used to determine any areas of bat activity. At least four nighttime emergence counts shall be undertaken on nights that are warm enough for bats to be active, as determined by a qualified bat biologist.

Depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on breeding special-status bats:

1. If active roosts are identified during pre-demolition surveys, a no-disturbance buffer will be created, in consultation with the CDFG, around active roosts during the breeding season. The size of the buffer will take into account factors such as the following:
 - a. Noise and human disturbance levels at the project site and the roost site at the time of the survey and the noise and disturbance expected during the construction activity;
 - b. Distance and amount of vegetation or other screening between the project site and the roost; and
 - c. Sensitivity of individual nesting species and the behaviors of the bats.

TABLE II-1 (CONT.)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

C. Biological Resources (cont.)	
	<ol style="list-style-type: none"> 2. If pre-demolition surveys indicate that no roosts of special-status bats are present, or that roosts are inactive or potential habitat is unoccupied, no further mitigation is required. 3. Pre-demolition surveys are not required for demolition activities scheduled to occur during the non-breeding season (September 1 through February 28). 4. Noisy demolition activities as described above (or activities producing similar noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any bats taking up roosts would be acclimated to project-related activities already under way). However, if trees are to be removed during the breeding season, the trees would be surveyed for roosts prior to their removal, according to the survey and protective action guidelines 1a through 1c, above. 5. Bat roosts initiated during demolition activities are presumed to be unaffected by the activity, and a buffer is not necessary. 6. Destruction of roosts of special-status bats and overt interference with roosting activities of special-status bats shall be prohibited. 7. The noise control procedures for maximum noise, equipment, and operations identified in Section IV.I of this EIR shall be implemented. 8. After consideration of LRDP Mitigation Measure III-D-2c, shrubs that have been determined to be unoccupied by special-status bats and that are located outside the no-disturbance buffer for active roosts may be removed.
Less than Significant Impacts	
<p>IV.C-1: Noise and activities associated with demolition may indirectly disturb nesting special-status birds such that they abandon their nests or such that their reproductive efforts fail.</p> <p>IV.C-2: Noise and activities associated with demolition on the project site could indirectly cause roost abandonment and death of the young of special-status bats roosting in the trees immediately to the east and south of the project site.</p> <p>IV.C-3: The proposed project could harm or temporarily disturb common wildlife species.</p> <p>IV.C-4: Demolition activities have low potential to disturb or result in mortality of special-status plant species or eliminate their habitat.</p> <p>IV.C-5: The cumulative impacts of the proposed project combined with all other development projects in the area could potentially result in a substantial reduction in open space or wildlife habitat.</p>	
Significant Impacts	
None.	

TABLE II-1 (CONT.)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

D. Cultural Resources	
Mitigation Measures Included as Part of the Proposed Project	
1987 LRDP EIR, as amended, Mitigation Measures	Project Measures and/or Contractor Specifications (identified in this EIR)
<p>Mitigation Measure III-E-1a: A photographic record will be made of all structures demolished as part of future projects.</p> <p>Mitigation Measure III-E-1b: An individual well-versed in the history of science in the twentieth century will evaluate the significance of specific pieces of equipment that may be replaced due to obsolescence or a change in the vector of research.</p>	None.
Less than Significant Impacts	
<p>IV.D-2: Implementation of the proposed project could cause a substantial adverse change in the significance of an as yet unknown archaeological resource and/or could disturb as yet unknown human remains.</p>	
<p>IV.D-3: None of the other proposed projects at LBNL, other projects at UC Berkeley, projects under the UC Berkeley 2020 LRDP, or potential buildout under the Berkeley General Plan would combine with the demolition of Building 51 to create a significant cumulative impact on cultural resources.</p>	
Significant Impacts	
<p>IV.D-1: The demolition of Building 51, including the Bevatron equipment within it, would cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5. This impact is unavoidable.</p>	
E. Geology and Soils	
Mitigation Measures Included as Part of the Proposed Project	
1987 LRDP EIR, as amended, Mitigation Measures	Project Measures and/or Contractor Specifications (identified in this EIR)
<p>Mitigation Measure III-B-1: Geologic and soils studies will be undertaken during the design phase of each LBNL building project. Recommendations contained in those studies would be followed to ensure that the effects of landsliding, lurching, and liquefaction potential will not represent a significant adverse impact during a seismic event.</p> <p>Mitigation Measure III-B-2a: Excavation and earth moving will be designed for stability, and accomplished during the dry season when feasible. Drainage will be arranged to minimize silting, erosion, and landsliding. Upon completion, all land will be restored, covering exposed earth with planting.</p> <p>Mitigation Measure III-B-2c: Excavations will be shored as required by law to preclude minor short-term landslides during construction.</p>	None required.

TABLE II-1 (CONT.)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

E. Geology and Soils (cont.)	
<p>Mitigation Measure III-B-2d: Revegetation of disturbed areas, including slope stabilization sites, using native shrubs, trees, and grasses will be included as part of all new projects.</p>	
Less than Significant Impacts	
<p>IV.E-1: Demolition of the proposed building, including earthmoving activities such as backfilling and grading, could result in soil erosion or loss of topsoil.</p> <p>IV.E-2: The proposed project, in combination with other existing and anticipated development at LBNL and in nearby areas, could potentially result in significant adverse geologic and soils impacts.</p>	
Significant Impacts	
None.	
F. Hazards and Hazardous Materials	
Mitigation Measures Included as Part of the Proposed Project	
1987 LRDP EIR, as amended, Mitigation Measures	Project Measures and/or Contractor Specifications (identified in this EIR)
<p>Mitigation Measure IV-K-1: LBNL will prepare an annual self-assessment summary report. The report will summarize environment, health, and safety program activities, and identify any areas where LBNL is not in compliance with laws and regulations governing hazardous materials, hazardous waste, hazardous materials transportation, regulated building components, worker safety, emergency response, and remediation activities.</p> <p>Mitigation Measure IV-K-2a: Prior to shipping any hazardous materials to any hazardous waste treatment, storage or disposal facility, LBNL will confirm that the facility is licensed to receive the type of waste LBNL is proposing to ship to that facility.</p> <p>Mitigation Measure IV-K-2b: LBNL will continue its waste minimization programs and strive to identify new and innovative methods to minimize hazardous waste generated by LBNL activities.</p> <p>Mitigation Measure IV-K-3: LBNL will require hazardous waste haulers to provide evidence that they are appropriately licensed to transport the type of wastes being shipped from LBNL.</p>	None required.

TABLE II-1 (CONT.)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

F. Hazards and Hazardous Materials (cont.)	
<p>Mitigation Measure IV-K-5: In addition to implementation of the numerous employee communication and training requirements included in regulatory programs, LBNL will undertake the following additional measures as ongoing reminders to workers of health and safety requirements:</p>	<ul style="list-style-type: none"> • Posting, in areas where hazardous materials are handled, of phone numbers of LBNL offices, which can assist in proper handling procedures and emergency response information. • Continuing to post "Emergency Response and Evacuation Plans" in all LBNL buildings. • Continuing to post all sinks in areas where hazardous materials are handled with signs reminding users that hazardous wastes cannot be poured down the drain. • Continuing to post dumpsters and central trash collection areas where hazardous materials are handled with signs reminding users that hazardous wastes cannot be disposed of as trash.
<p>Mitigation Measure IV-K-6: LBNL will update its emergency preparedness and response program on an annual basis, and will provide copies of this program to local emergency response agencies and to members of the public upon request.</p>	
Less than Significant Impacts	
<p>IV.F-1: Project-related activities that include removal of lead dust or asbestos building materials, cutting or removal of equipment or structural materials, or the processing and removal of concrete shielding blocks or slabs would involve substances that could be a hazard to workers, the public or the environment.</p>	
<p>IV.F-2: Demolition activities associated with the proposed project would include earthmoving activities such as grading and filling that could expose construction workers or the environment to hazardous materials.</p>	
<p>IV.F-3: The project would reduce exposure of people and structures to wildland fire hazards.</p>	
<p>IV.F-4: The proposed project, when combined with other proposed LBNL and nearby development, would result in a decreased exposure to hazards and hazardous materials.</p>	
Significant Impacts	
None.	

TABLE II-1 (CONT.)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

G. Hydrology and Water Quality	
Mitigation Measures Included as Part of the Proposed Project	
1987 LRDP EIR, as amended, Mitigation Measures	Project Measures and/or Contractor Specifications (identified in this EIR)
<p>Mitigation Measure III-B-2a: Excavation and earth moving will be designed for stability, and accomplished during the dry season when feasible. Drainage will be arranged to minimize silting, erosion, and landsliding. Upon completion, the land will be restored, covering exposed earth with planting.</p> <p>Mitigation Measure III-B-2d: Revegetation of disturbed areas, including slope stabilization sites, using native shrubs, trees, and grasses, will be included as part of all new projects.</p> <p>Mitigation Measure III-C-2: Each individual project will continue to be designed and constructed with adequate storm drainage facilities to collect surface water from roofs, sidewalks, parking lots, and other surfaces and deliver it into existing channels which have adequate capacity to handle the flow.</p> <p>Cumulative Impacts: Potential adverse impacts to water quality can be reduced if LBNL adopts feasible mitigation measures to control surface water runoff, prevent erosion, and maintain adequate drainage facilities.</p>	None required.
Less than Significant Impacts	
<p>IV.G-1: Wastewater and runoff associated with the proposed project could become contaminated by various sources on the demolition site and could enter the stormwater system or the adjacent environment. The Storm Water Pollution Prevention Plans developed for the various phases of the proposed demolition project would reduce the potential for pollutants to affect water quality in downstream receiving water courses, municipal wastewater systems, or natural aquatic habitats.</p> <p>IV.G-2: The change in site use following the demolition of Building 51 would result in an overall decrease of pollutants in the stormwater discharged from the area.</p> <p>IV.G-3: Under post-demolition conditions, the proposed project would not increase, and under some stormwater conditions, would locally decrease, stormwater runoff rates and volumes.</p> <p>IV.G-4: The proposed project, together with other proposed LBNL development projects and other development projects at UC Berkeley and within the city of Berkeley, would result in less-than-significant cumulative hydrologic and water quality impacts.</p>	
Significant Impacts	
None.	
H. Land Use and Planning	
Mitigation Measures Included as Part of the Proposed Project	
1987 LRDP EIR, as amended, Mitigation Measures	Project Measures and/or Contractor Specifications (identified in this EIR)
None required.	None required.

TABLE II-1 (CONT.)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Less than Significant Impacts	
IV.H-1: Proposed demolition activities would create temporary and intermittent impacts that could affect adjacent land uses.	
IV.H-2: The proposed project would result in a change of use on the project site.	
IV.H-3: The project could potentially contribute to a significant cumulative land use impact.	
Significant Impacts	
None.	
I. Noise	
Mitigation Measures Included as Part of the Proposed Project	
<i>1987 LRDP EIR, as amended, Mitigation Measures</i>	<i>Project Measures and/or Contractor Specifications (identified in this EIR)</i>
Mitigation Measure III-K-1: Projected noise levels will be compared with ambient noise levels and the Berkeley Noise Ordinance limits, or other applicable regulations. Acoustical performance standards would be included in future contract documents. LBNL will continue to design, construct and operate buildings and building equipment taking into account measures to reduce the potential for excessive noise transmission. ²	None required.
Mitigation Measure III-K-2: Noise-generating construction equipment will be located as far as possible from existing buildings. If necessary, windows of laboratories or offices will be temporarily covered to reduce interior noise levels on-site.	
Less than Significant Impacts	
IV.I-1: Demolition activities associated with the project would generate intermittent and temporary noise levels that would increase off-site ambient noise levels above existing levels.	
IV.I-2: The project could potentially result in a cumulatively considerable contribution to noise impacts.	
Significant Impacts	
None.	
J. Public Services	
Mitigation Measures Included as Part of the Proposed Project	
<i>1987 LRDP EIR, as amended, Mitigation Measures</i>	<i>Project Measures and/or Contractor Specifications (identified in this EIR)</i>
None required.	None required.
Less than Significant Impacts	
IV.J-1: Demolition activities could temporarily affect fire and police response times.	
IV.J-2: Project demolition truck trips would cause wear and tear on public roads and highways.	

² "Demolition" is substituted for "construction" and "building" as necessary in the application of these mitigation measures to demolition projects at LBNL.

TABLE II-1 (CONT.)

SUMMARY OF IMPACTS AND MITIGATION MEASURES

IV.J-3: The proposed project, together with existing and anticipated future development at LBNL and in the surrounding area, could result in a cumulative increase in demand for police and fire protection services.

Significant Impacts

None.

K. Transportation / Traffic

Mitigation Measures Included as Part of the Proposed Project

*1987 LRDP EIR, as amended,
Mitigation Measures**Project Measures and/or Contractor Specifications
(identified in this EIR)*

None required.

IV.K-1: The frequency of truck trips (loaded or empty) shall be no greater than (a) one every 10 minutes (six truck trips per hour) during the a.m. and p.m. peak commute hours, and (b) one every five minutes (12 truck trips per hour) during periods other than the a.m. and p.m. peak commute hours.

Under this limitation, the projected level of truck traffic would have minimal and less-than-significant effects on traffic flow, even if those trucks were to travel through the congested intersections on University Avenue at San Pablo Avenue and Sixth Street during the peak commute hours. Project-generated hourly truck trips would represent an increase of no more than about 0.9 percent above the a.m. and p.m. peak-hour traffic volumes, respectively, at the above-cited congested intersections.³

Less than Significant Impacts

IV.K-1: The proposed project, including demolition and earthmoving activities such as excavation, backfill, and grading, would temporarily and intermittently increase traffic volumes on roadways used by demolition-related vehicles.

IV.K-2: Demolition workers would use the Building 51 staging area for parking.

IV.K-3: The project could potentially affect transit service in the project area.

IV.K-4: The project would generate truck trips carrying hazardous materials, potentially affecting safety.

IV.K-5: The proposed project, in combination with planned, pending, and/or reasonably foreseeable projects in the area of the proposed project could alter traffic patterns in the project area.

K. Transportation / Traffic (cont.)

SIGNIFICANT IMPACTS

None.

³ The maximum 0.9-percent increase was calculated using six one-way truck trips (one every ten minutes), a passenger-car-equivalence of three cars per one truck, and existing a.m. peak-hour traffic volumes on University Avenue. The percent increase with any other combination of values (e.g., four one-way truck trips, or existing p.m. peak-hour volumes, or total intersection volumes, or cumulative volumes) would be less than 0.9 percent.

TABLE II-1 (CONT.)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

L. Utilities, Service Systems and Energy	
MITIGATION MEASURES INCLUDED AS PART OF THE PROPOSED PROJECT	
<i>1987 LRDP EIR, as amended, Mitigation Measures</i>	<i>Project Measures and/or Contractor Specifications (identified in this EIR)</i>
Mitigation Measure III-M-1: Prior to construction of any project which may add significant sewer load to the city sanitary sewer system, LBNL will investigate the potential impact of the project on the city system. LBNL will identify mitigation measures to accommodate the sewer load if the impact investigation indicates that the city system could not accommodate the additional sewage. LBNL will reimburse the City of Berkeley and/or EBMUD for its fair share of allowable and necessary sewer improvement capital costs which are needed to accommodate increased demand and mitigate sewer impacts resulting from implementation of the LBNL LRDP.	None required.
Less than Significant Impacts	
IV.L-1: The project would generate demolition waste and debris, which could reduce the available capacity of landfills.	
IV.L-2: The project would use existing water services.	
IV.L-3: The project could generate wastewater.	
IV.L-4: The project would consume energy resources.	
IV.L-5: The project, in concert with other development at LBNL and in the surrounding area, would not cumulatively contribute to a significant cumulative utilities impact.	
Significant Impacts	
None.	

CHAPTER III

Project Description

A. Introduction

Lawrence Berkeley National Laboratory (LBNL; also referred to as “Berkeley Lab,” “the Laboratory,” or “the Lab” in this document) is an approximately 200-acre multi-program research laboratory operated and managed by the University of California (UC or the University) under a contract with the U.S. Department of Energy (DOE). This environmental impact report (EIR) evaluates a proposal to demolish the Bevatron and the structure housing it, Building 51,¹ at Berkeley Lab.

The approximately 180-foot-diameter Bevatron was constructed as a proton synchrotron—a particle accelerator that accelerated protons within a beam pipe to near the speed of light. When the protons struck “targets” composed of various materials placed within a target chamber, the resulting interactions often produced new types of particles. Study of these interactions and the particles themselves led to important advances in the fields of particle and nuclear physics. Later modifications of the Bevatron enabled researchers to accelerate heavy ions and expand the facility’s usefulness in additional areas, including medical research, cancer treatment, and cosmic ray experiments. During its operation from 1954 until 1993, the Bevatron was among the world’s leading accelerators, and during the 1950s and 1960s four Nobel Prizes were awarded for work that utilized this apparatus.

Building 51 is a large, approximately 126,500-gross-square-foot steel-frame shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop, and office functions. Since the end of the Bevatron’s operations in 1993, Building 51 has had limited use for equipment storage, office space, and dry laboratories (e.g., for computer repair). The history of the facility is discussed in Section IV.D, Cultural Resources.

Under the proposed project, the Bevatron apparatus would be disassembled, Building 51 and the foundation underneath the building demolished, and the resulting debris and other materials removed. The site would then be backfilled, and the fill compacted and leveled. This would make future reuse of the site more feasible, although further preparatory site work outside of the scope of this project would be necessary. However, there are no firm plans for future development of the site at this time.

¹ Building 51 includes Building 51A, an integral addition to the main building.

B. Project Objectives

The primary objectives of the Building 51 and the Bevatron demolition project are as follows:

- Eliminate potential hazards associated with Building 51;
- Reduce the burden on LBNL maintenance resources;
- Free space for potential future activities; and
- Help satisfy a DOE policy requiring that the square footage of new construction at a DOE facility be balanced by elimination of an equivalent amount of excess space.²

The Bevatron and Building 51 are no longer needed by LBNL. The Bevatron has not operated since 1993 and is non-functional. The Building 51 structure housing the Bevatron is deteriorating and consumes disproportionate maintenance resources. It does not meet current building codes, the roof leaks in several locations, and portions of the structure do not comply with current seismic design standards.³ In addition, removal of the building and its contents would free the site, which is one of the few relatively large flat areas at LBNL, for future development and support of the Laboratory's missions. Within its scientific divisions,⁴ Berkeley Lab staff perform research in the computing sciences, physical sciences, energy sciences, biosciences, and general sciences; develop and operate national experimental facilities for LBNL and visiting researchers; educate and train future generations of scientists and engineers to promote national science and education goals; and disseminate knowledge to users nationwide, fostering productive relationships between LBNL's research programs and other research institutions and industry.

However, while development of the site is likely at some point in the future, at this time, there are no firm plans for future development that have reached the level of a proposed or reasonably foreseeable action. Due to the speculative nature of a future project, CEQA review of such development would be premature at this time. Separate CEQA documentation would be conducted if and when necessary for any future project. Future development at the site would be consistent with the 1987 Long Range Development Plan (LRDP) and 1987 LRDP EIR, as amended, or with two documents currently being prepared by Berkeley Lab that will supersede these current documents: the 2006 LBNL Long Range Development Plan and its accompanying LRDP EIR.

C. Project Location and Existing Conditions

LBNL is located in the cities of Berkeley and Oakland in Alameda County on property owned by the University of California. The project site comprises approximately four acres. Of this total,

² No specific proposed facility at LBNL is contingent or otherwise dependent upon this proposed demolition project.

³ The current UC seismic rating for Building 51 is "fair."

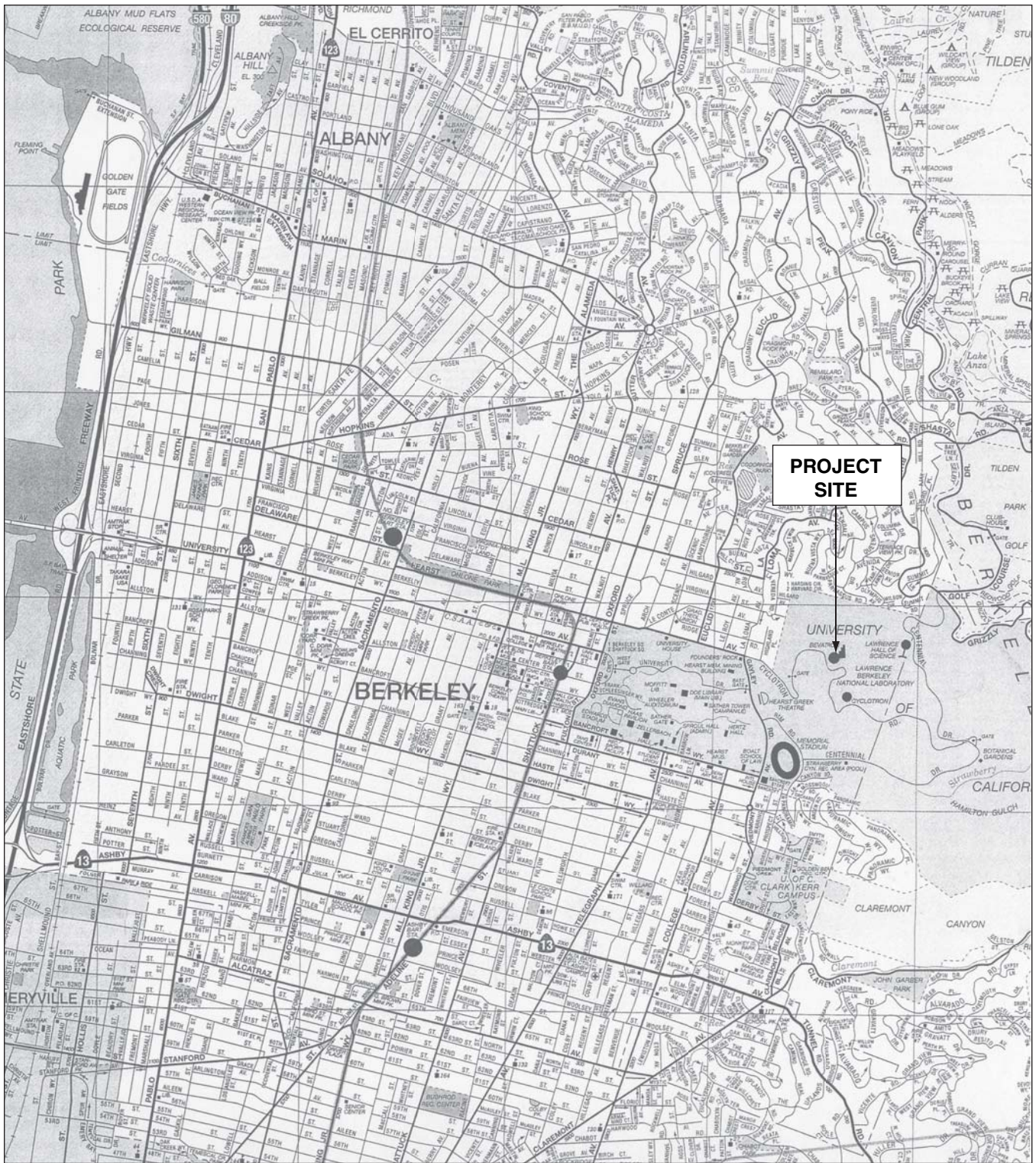
⁴ Berkeley Lab's research divisions include the National Energy Research Scientific Computing Center, Computational Research, Information Technologies and Services, the Advanced Light Source, Chemical Sciences, Materials Sciences, Physical Biosciences, Earth Sciences, Environmental Energy Technologies, Genomics, Life Sciences, Accelerator and Fusion Research, Nuclear Science, and Physics.

approximately 2.25 acres (the “demolition zone”) would be converted from developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another use for this area is proposed, approved, and initiated. The remaining acreage would be used for parking and staging. The site is located within the City of Berkeley portion of LBNL, in the west-central part of LBNL, and is located adjacent to Lawrence Road (from which vehicles enter and leave the site) and McMillan Road within Berkeley Lab. See **Figures III-1** through **III-4**. Laboratory, office, engineering, and computing functions occupy the LBNL buildings immediately adjacent to Building 51. Open space or landscaped areas border the site immediately to the east and north. Surrounding land uses include residential areas to the north of the LBNL property line; LBNL buildings and UC Berkeley athletic fields to the south; LBNL buildings, non-UC Berkeley residences, and UC Berkeley student housing, amphitheater, and classrooms to the west; and additional LBNL buildings and the UC Berkeley Lawrence Hall of Science to the east. Building 51 is approximately 1,100 feet from the nearest residences to the west and north, and about 1,300 to 1,400 feet from the Lawrence Hall of Science to the east.

The project site is entirely developed with the exception of two small areas of ornamental landscaping at the entrance to Building 51. With the exception of two ornamental low-lying trees at this location, no trees would be removed as a result of the project. Small areas of the site are underlain by the edges of two groundwater plumes containing volatile organic compounds (VOCs). Soils underneath portions of the site were contaminated by VOCs, petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and/or mercury that were released at unknown times during the period when the Bevatron was in operation. Starting in the early 1990s, investigation and cleanup actions have been undertaken. These actions are under the oversight of the California Department of Toxic Substances Control, which consults with such other agencies as the San Francisco Bay Regional Water Quality Control Board, DOE, and the City of Berkeley Toxics Management Division. As a result of the completion of interim corrective measures at two soil units at Building 51 under the Laboratory's Environmental Restoration Program, soil contaminants have been reduced to levels considered "protective of human health and the environment" under U.S. Environmental Protection Agency risk assessment guidelines. Groundwater contamination continues to be remediated under the Environmental Restoration Program. Contamination and remediation activities are discussed in more detail in Section IV.F, Hazards and Hazardous Materials. The site is not listed on the California Environmental Protection Agency (Cal/EPA) Hazardous Waste and Substances Sites List compiled pursuant to Government Code Section 65962.5, also known as the Cortese List.

D. Project Characteristics/Components

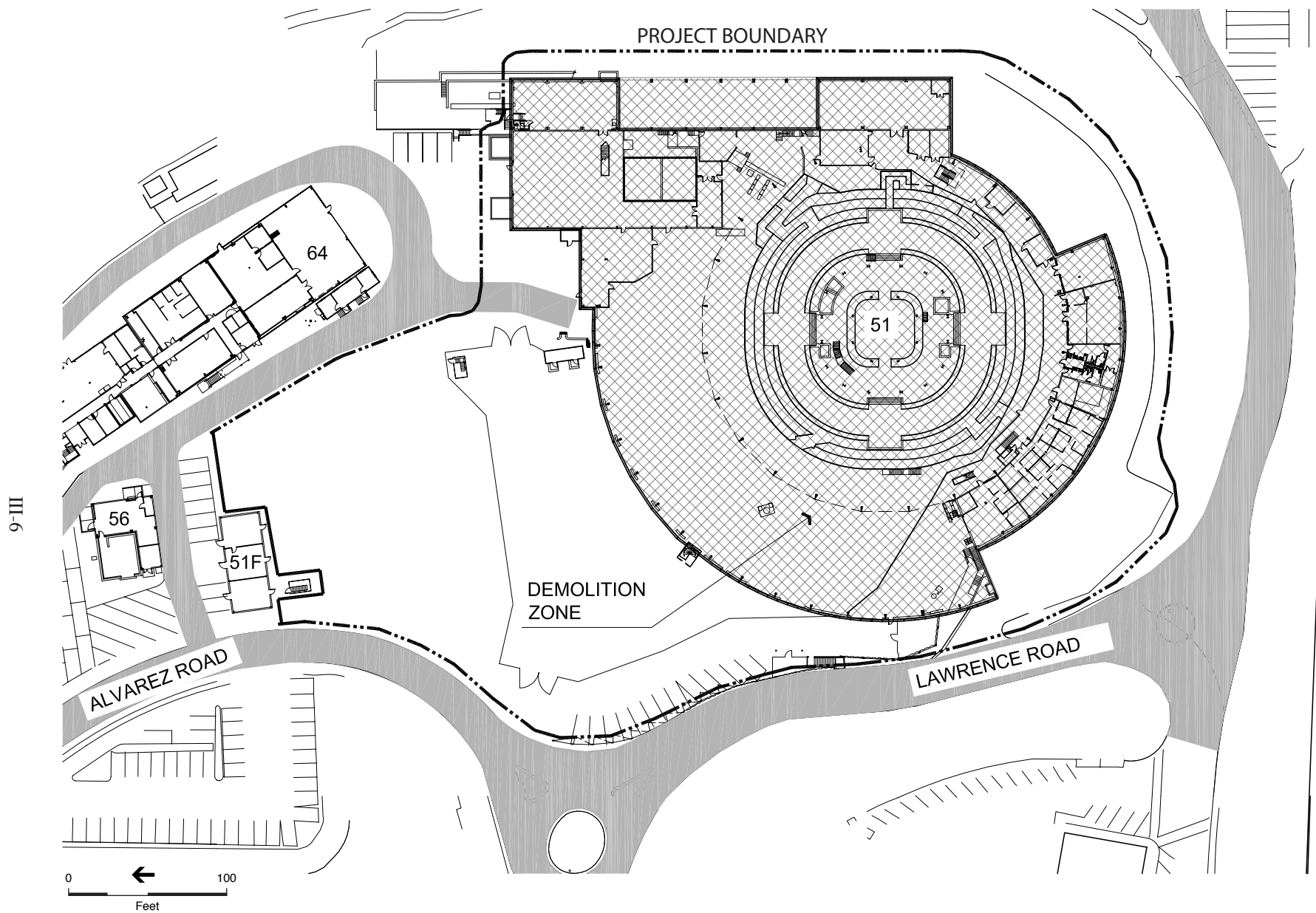
In brief, under the proposed project, the concrete block shielding surrounding the Bevatron would be removed, the Bevatron apparatus disassembled, Building 51 and the shallow foundation underneath the building demolished, and the resulting debris and other materials removed. The site would then be backfilled, and the fill compacted to grade. This would make future reuse of the site more feasible, although further preparatory site work outside of the scope of this project would be necessary.



SOURCE: Environmental Science Associates

Demolition of Building 51 and the Bevatron / 204442 ■

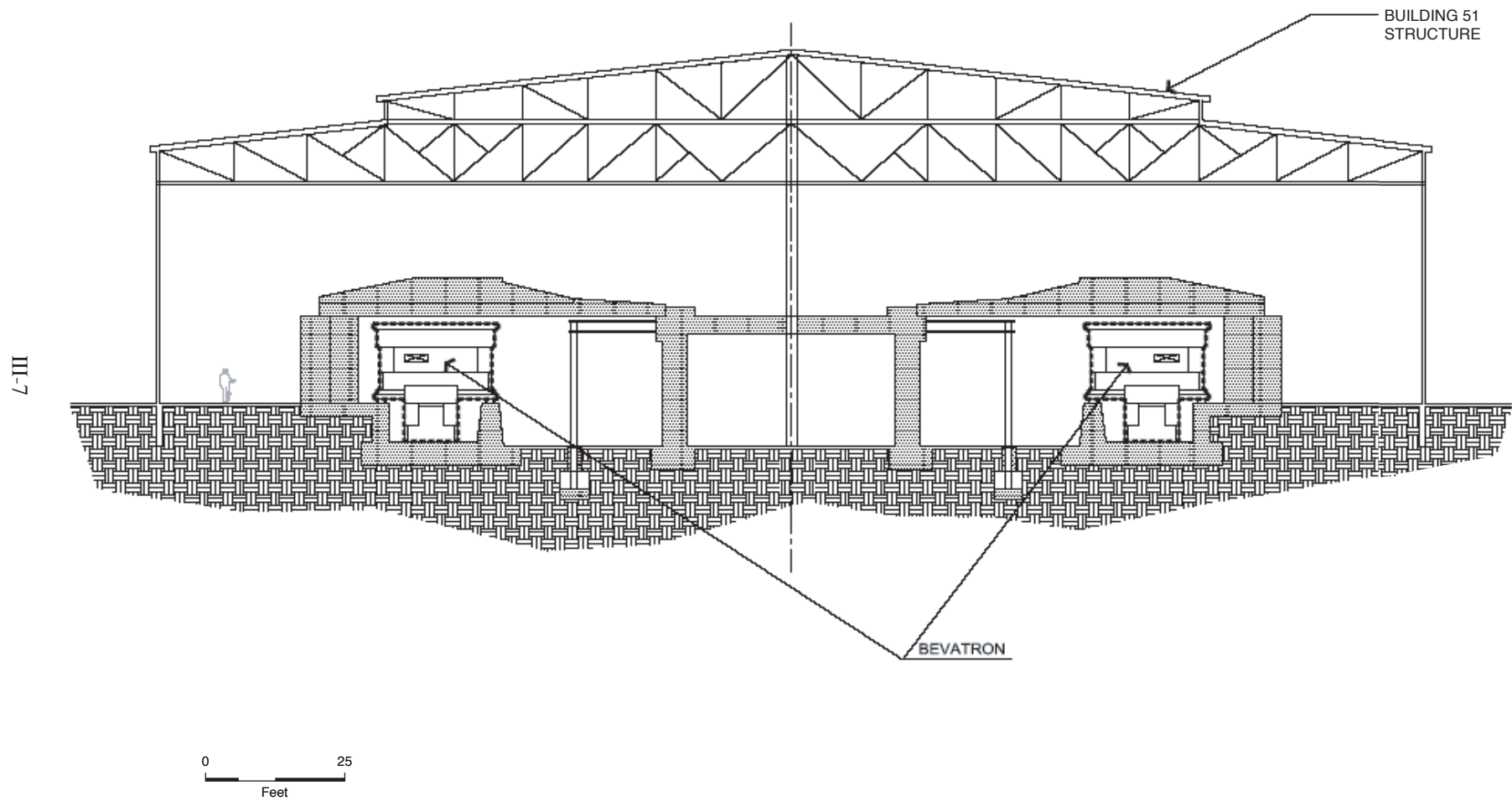
Figure III-1
Regional Map



SOURCE: LBNL (2005)

Demolition of Building 51 and the Bevatron / 204442 ■

Figure III-3
Bevatron within Building 51 Project Area



SOURCE: LBNL (2005)

Demolition of Building 51 and the Bevatron / 204442 ■

Figure III-4
Bevatron within Building 51 Section Diagram

Project Activities

The project would entail the removal of approximately 22,000 to 26,000 tons of reinforced concrete, structural steel, siding, glass, and other building materials; 12,000 to 16,000 tons of reinforced concrete shielding blocks that enclose the Bevatron and protected personnel from penetrating radiation produced by the Bevatron when it was in operation; and 12,000 to 15,000 tons of Bevatron materials, mostly metals, such as yokes, support steel and equipment. Approximately half of the shipments of materials that would be generated by the project would consist of non-hazardous debris and other items typical of building demolition projects. The other half of these shipments would be of materials having some hazardous characteristics. As described in greater detail in Section IV.F, Hazards and Hazardous Materials, portions of the Bevatron apparatus, its concrete block shielding, and other items have low levels of induced radioactivity above naturally-occurring levels, due to their exposure to neutron and charged particle radiation produced by the Bevatron. Also, there may be small amounts of surface radioactivity on some pieces of equipment.⁵ The concrete in a small number of shielding blocks contains concentrations of uranium slightly above background levels, and a small number of other shielding blocks are composed of depleted uranium encased in steel. Other types of hazardous materials also would be encountered. For example, the exterior siding of Building 51 is made of transite, an asbestos-containing material, and some surfaces were painted with lead-containing paint.

The duration of the physical work for the project may vary from four to seven years, from early 2006 through 2009 or 2012, contingent upon funding and results of material sampling. For the purposes of conservative impact assessment, where impacts presumably are intensified in a shorter project timeframe, the project is assumed to take place over a four-year period.

Apart from planning activities and actions to secure the site (e.g., locating and deactivating electrical lines as necessary), the main categories of project activities would be as follows:

Clean-out would remove equipment and materials that are not an integral part of the building structure. This includes the 750 to 800 concrete shielding blocks and the Bevatron itself. The shielding blocks would be removed in advance of the Bevatron components. The Bevatron itself, including steel yokes, magnets, and beamline pipes, would then be disassembled using such means as pneumatic impact tools, saw cutting, and possibly torch cutting. Other large mechanical equipment (e.g., fans and electrical panels) would also be removed, using similar methods.

Demolition would involve removal of the building structure and its shallow foundations. The general sequence of demolition activities would be (1) identification and isolation of building elements to be demolished; (2) removal of non-structural materials; (3) removal of non-load-bearing structural elements; and (4) removal of load-bearing structural elements.

⁵ Induced radioactivity was produced when energetic particles from the accelerator interacted with elements in items struck by the beam. Surface radioactivity resulted from the presence of radioactive targets that were used in some accelerator experiments. It is anticipated that very limited amounts of surface radioactivity, affecting a small volume of materials, would be encountered.

Manual removal of the external asbestos-containing siding materials, by unbolting fasteners, would be conducted prior to building demolition to prevent creation of airborne particles. The roof membrane and sections of the roof structure would be removed to permit the dismantling and removal of three cranes that are within the building. The building superstructure would be dismantled and demolished to the grade level concrete slab. This slab would be surveyed, decontaminated if required, and removed along with the shallow foundation structures. Those portions of the concrete slab that are not beneath the building would remain in place. In addition, a cooling tower adjacent to and surrounded on three sides by Building 51 that formerly provided chilled water for air conditioning would be demolished and removed. Deep underground concrete foundations would remain, as would most of the concrete retaining walls that support the hillside above the facility.

The Building 51 outer wall forms a portion of the retaining walls. In order to keep the hillside in place during and after the building is demolished, approximately 170 feet of new concrete retaining wall would be constructed inside Building 51 prior to the demolition of that building, which would be kept in place after demolition.

The particular demolition methods that would be employed have not been finalized. However, the most likely methods for the removal of the superstructure would involve the use of mobile cranes and other heavy equipment for superstructure dismantling, in conjunction with torch and mechanical cutting procedures. The concrete slab and foundations would be demolished using pneumatic, hydraulic, and/or chemical breaking techniques. For the latter, an expansive slurry would be poured into holes drilled into the concrete mass. Over several hours, this product expands through the process of hydration, generating cracks between holes and free faces in reinforced concrete. The slurry hardens into a non-hazardous solid that would be disposed of in the same manner as the concrete itself, and would not pose any contamination issues.

Materials disposition would occur at various stages of the project. About half of the demolition materials would consist of non-hazardous debris and other items typical of demolition projects. The project would seek to reuse or recycle such materials (e.g., uncontaminated metals and concrete) where feasible. For example, uncontaminated metals might go to scrap dealers. Items that could not be salvaged would be sent to appropriate municipal landfills, such as the Altamont Landfill in Livermore, California.

Some materials are not suitable for salvage and cannot be sent to municipal landfills. For example, while it is known that there is no radioactivity above naturally-occurring levels in the outer structure of Building 51, portions of the Bevatron apparatus, the concrete block shielding, and other items have low levels of such radioactivity. Also, some non-radioactive hazardous materials would be encountered, including asbestos, lead, mercury, machine oils, and polychlorinated biphenyls. As part of Berkeley Lab's Environment, Health and Safety program, sampling and instrument surveys are conducted at various facilities, including Building 51, to characterize the types, locations, and degree of chemical or radiological contamination. Such monitoring would be continued at Building 51 during the project. Potentially contaminated items

would be screened and characterized based on their location and the associated degree of potential hazard.

In general, characterization of potentially radioactive materials would be accomplished by taking external radiation measurements using appropriate survey instrumentation and/or swipe samples according to DOE-approved protocols. The results of these surveys would determine the eventual destinations of the materials. For example, concrete shielding blocks that are found to have no detectable DOE-added radioactivity could be transferred to a third party for reuse, transferred to a third party for crushing and recycling, or transported to a landfill permitted to accept this type of waste.

Any items showing detectable DOE-added radioactivity would be sent to an approved disposal site, such as Envirocare in Clive, Utah (a licensed, privately operated facility), or the Nevada Test Site (a DOE facility approximately 65 miles from Las Vegas). Also, other DOE facilities are permitted to receive and reuse such materials, for example, for their own accelerator operations. However, at this time, no DOE users for Bevatron components or shielding blocks have been found. Based on prior experience, the Laboratory anticipates that less than one-third of the shielding blocks would have detectable DOE-added radioactivity (see Section IV.F, Hazards and Hazardous Materials). It is expected that much of the Bevatron apparatus itself will have detectable radioactivity.

Items contaminated with non-radioactive hazardous materials would be sent to treatment and disposal facilities or landfills permitted to receive such items. Mixed waste (i.e., waste that is both hazardous and radioactive) would be handled in accordance with applicable regulations and DOE policies. In addition, the project would comply with the DOE Metals Recycling Moratorium, which restricts metals from radiological areas from being recycled. This moratorium and other materials disposition issues are discussed in Section IV.F, Hazards and Hazardous Materials.

Testing, fill replacement, and stabilization would be the final set of field activities. The area to be demolished extends to the exterior of Building 51. Soil under this area would be surveyed for contaminants under the auspices of the Laboratory's Environment, Health, and Safety (EH&S) Division. Residual chemical or radiological contamination, if any, would be addressed by the EH&S Division in consultation with the appropriate regulatory agency. Contamination and remediation issues are discussed in Section IV.F, Hazards and Hazardous Materials. Radiological contamination of the soil is not anticipated, due to the shielding provided by the foundation of the building.

The open area, or demolition zone, which would be approximately 2.25 acres, would then be backfilled with suitable clean fill material and compacted to grade in accordance with engineering requirements. The source of this material would be determined at the time of need, based upon local supply, and would be partially drawn from LBNL stockpiles, e.g., from clean soil excavated for the Lab's Molecular Foundry or other projects. It is also likely that some clean residual rubble from the slab and foundations would be used as fill material. Although the Laboratory would use clean LBNL-derived fill material as much as possible, this EIR conservatively assumes that half of the project's backfill requirements would be fill certified as clean by the provider and brought

in from off-site. The demolition zone would be hydro-seeded with native grasses. Sampling wells for the Laboratory's Environmental Restoration Program would continue to function. The project would not add any impervious surfaces to Berkeley Lab. There are no longer any natural drainages on the site, and no streams or rivers would be altered.

Utility systems that traverse the project site and serve other areas would need to remain in continuous operation; thus, new segments would be built to re-route those services prior to disconnection at Building 51. No new utility connections would be required.

If it would be necessary to perform some work activity after sunset or before sunrise, such as truck loading and departure, or to complete a critical phase of work that would not cause significant noise or other impacts, the Lab would install night shields on all outdoor fixtures used during demolition activities to minimize potential light and glare spillover impacts.

Project-Related Traffic and Employment

An estimated maximum of about 4,700 one-way truck trips would be required over the four- to seven-year term of the project. Most of the trips would be one of two types: (1) trips removing material (inbound trips with empty trucks and outbound trips removing material for appropriate disposal), or (2) trips delivering backfill (inbound trips delivering clean backfill and outbound empty trucks). Other truck trips would be for the delivery of project-related demolition equipment and miscellaneous supplies.

Demolition materials would be staged at or near the project site, inside the LBNL property line. Truck shipments from the site are planned to proceed west on Hearst Avenue, south on Oxford Street, and then west on University Avenue to Interstate 80. Shipments to the site would follow this route in reverse. Demolition work would be conducted approximately 40 hours per week, Monday through Friday. Normal work hours would be between 7:00 a.m. and 3:30 p.m. It is possible that some truck loading and departure would take place on Saturdays and/or Sundays, although this would be infrequent. No roads would be closed as a result of the action, and no new roads, road extensions, or improvements would be required. Similarly, project equipment (including excavators, front-end loaders, graders, hoe-rams, and mobile cranes) would be staged at or near the site, primarily at the parking lot north of Building 51. Traffic impacts are discussed in Section IV.K, Transportation/Traffic.

Demolition activities would require temporary workers. Their number would vary over the multi-year demolition period, but is estimated to be about 20 to 25 workers on average per day, with a maximum of up to about 50 workers. For the purpose calculating traffic impacts, this EIR conservatively assumes that all would drive alone to the project site. Parking would be available near the site or elsewhere at LBNL. Population impacts are discussed in the NOP, provided in Appendix A of this EIR.

E. Project Environmental and Workplace Controls

As a federal facility conducting work within the University of California's mission, LBNL is generally exempt under the federal and state constitutions from compliance with local requirements. Although LBNL seeks to cooperate with local jurisdictions to reduce the physical consequences of its activities to the extent feasible, the Laboratory is subject to local requirements only when the federal government has unequivocally waived its sovereign immunity with respect to such requirements, and when the local government has a specific delegation of state authority for an applicable requirement. LBNL projects must comply with the general policies and procedures of DOE and the University of California, and applicable regulatory requirements and guidelines of federal and state agencies that regulate workplace health and safety, and environmental quality.

Agency-approved environmental protection measures would be employed as part of the proposed project, including dust and hazardous materials controls specified by Bay Area Air Quality Management District regulations and guidelines; hazardous waste handling in accordance with Cal/EPA, DOE, and other agency requirements; and stormwater pollution prevention measures as required by the San Francisco Bay Regional Water Quality Control Board. Further, as described in Chapter I, Introduction, applicable mitigation measures from Berkeley Lab's program EIR, the 1987 LRDP EIR, as amended, would be part of this present project. Also, as part of its normal operations, the Laboratory would implement other measures to address site-specific potential environmental impacts.

LBNL has an organizational structure and the technical expertise to self-monitor and control on-site safety and environmental conditions so that LBNL implements DOE and UC policies and procedures, complies with federal and state regulatory requirements, adheres to agreements with other parties, and carries out applicable mitigation measures.

A primary mechanism at LBNL for implementing these requirements and agreements into specific projects is to incorporate them into the general contract terms and conditions for the contractor that will be conducting the demolition work, and then to monitor the contractor's implementation steps and the efficacy of the measures. LBNL or independent technical staff would conduct project-related monitoring and/or oversight to assure that the requisite control measures implemented by the contractor are effective in controlling off-site emissions and on-site health and safety risks.

For the proposed demolition project, a series of reviews has been and continues to be performed by LBNL to identify potential adverse effects and to assess and develop the environmental monitoring and the structural and operational control measures needed to prevent project actions from exceeding relevant standards. LBNL has adapted existing procedures, or has prescribed new specific procedures or performance standards, to assure that the proposed project would be in regulatory compliance. Although not all of these specific procedures or performance standards for the proposed project have been completed, LBNL policy (as described, for example, in various

sections of LBNL PUB-3000, Berkeley Lab's Health and Safety Manual), requires that they be complete and in place before work may proceed.

The above policies and procedures, regulatory requirements, voluntary agreements, and mitigation measures are thus part of the proposed project, and are discussed as appropriate in the individual impact sections in Chapter IV.

F. Required Project Approvals

LBNL is located on land owned by the University of California. The Board of Regents of the University of California (The Regents) is the University's decision-making body. The Regents have delegated authority to the Director of LBNL to approve this type of project, including approval of the EIR for the project. The Bay Area Air Quality Management District is the agency primarily responsible for regulation of air quality at LBNL. An asbestos demolition notification to this agency would be required. If regulated asbestos is present in excess of specific amounts, an asbestos renovation notification to this agency would also be needed. Air quality issues are discussed in Section IV.B, Air Quality, of this EIR.

Following the requirements of the National Historic Preservation Act and a Memorandum of Agreement among DOE, the California State Historical Preservation Officer, and the Advisory Council on Historic Preservation, LBNL prepared a Historic American Engineering Record (HAER) report for the Bevatron. The HAER report was accepted by the National Park Service (NPS) in March 1998. Additional historical documentation - an addendum to the existing HAER report for the facility - would be completed and would be required to be accepted by NPS prior to demolition of the facility. This process is discussed in Section IV.D, Cultural Resources.

Stormwater generated within the LBNL facility is managed in conformance with LBNL's National Pollutant Discharge Elimination System (NPDES) California General Permit for Storm Water Discharges Associated with Industrial Activity. Under authority delegated by the State Water Resources Control Board, oversight and enforcement of this permit is provided by the San Francisco Bay Regional Water Quality Control Board and the City of Berkeley. Implementation of the permit requirements is detailed in LBNL's Stormwater Pollution Prevention Plan (SWPPP) and Storm Water Monitoring Plan (SWMP). As the area of soil proposed to be exposed would exceed one acre, application for coverage under the State General Construction NPDES permit and development of a project-specific SWPPP would be required. As part of the SWPPP, a project-specific erosion control plan would be included in the project engineering process and implemented during demolition to reduce short-term water quality impacts associated with construction. Stormwater issues are discussed in Section IV.G, Hydrology and Water Quality.

G. LRDP Consistency

The primary planning document for development at LBNL is the Laboratory's Long Range Development Plan, adopted by the University of California in August 1987, and accompanied by the 1987 LRDP EIR, as amended. The proposed project would be consistent with these

documents. The project would not add new buildings or increase permanent personnel at LBNL, and would be within the space and population levels anticipated. Demolition of outmoded structures is envisioned in the LRDP and 1987 LRDP EIR, as amended, and the project would not result in a land use conflict.⁶

⁶ For example, one of the site planning concepts for Berkeley Lab set out in the 1987 LRDP is to redevelop obsolete buildings and infrastructure (LBNL, 1987, p. 13).